

Spontaneous fission properties of ^{262}Rf

M.R. Lane, K.E. Gregorich, D.M. Lee, M.F. Mohar, M. Hsu, C.D. Kacher, B. Kadkhodayan, M.P. Neu, N.J. Stoyer, E.R. Sylwester, J.C. Yang, and D.C. Hoffman

In the time since our experiment on the spontaneous fission properties of ^{262}Rf was last reported¹, we have obtained more data and have published the results². We have measured the mass and kinetic-energy distributions of 200 pairs of coincident fission fragments from the spontaneous fission (SF) of ^{262}Rf . The ^{262}Rf was produced via the $^{244}\text{Pu} (^{22}\text{Ne}, 4n)$ reaction with a production cross section of ~ 0.7 nb using 114.4-MeV projectiles. The kinetic energies and times of the coincident fission fragments were measured using our rotating wheel system. From these data the half-life, mass, and kinetic-energy distributions were derived. The total kinetic-energy (TKE) distribution (Fig. 1) appears to consist of a single component with a most probable pre-neutron-emission TKE of 215 ± 2 MeV. The mass distribution (Fig. 2) is symmetric with a full width at half maximum of about 22 mass numbers. These results are consistent with trends observed for other trans-berkelium spontaneously fissioning isotopes. We determined the half-life to be 2.1 ± 0.2 s by measuring its spontaneous fission decay. We also attempted to observe the alpha decay of ^{262}Rf by searching for alpha decay correlated in time with SF from the alpha daughter, 1.2-ms ^{258}No . We observed no such decays and have set an upper limit of 0.8% (68% confidence level) on the alpha decay branch of ^{262}Rf .

References

1. D.C. Hoffman et al.; K.E. Gregorich et al., LBL-35768, Annual Report (1993).
2. M.R. Lane et al, Phys. Rev. C **53**, 2893 (1996).

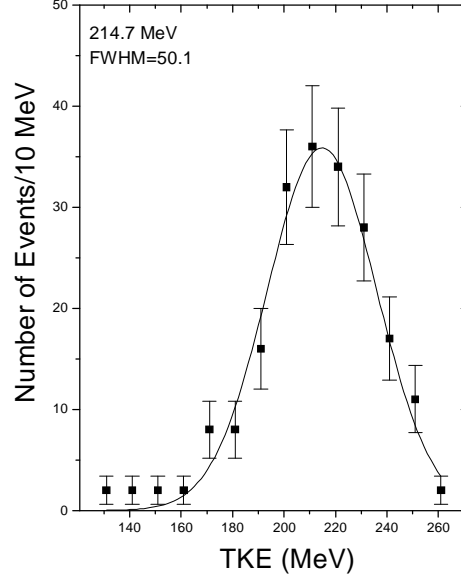


Fig. 1. Gaussian fit to the pre-neutron-emission TKE distribution from the SF of ^{262}Rf .

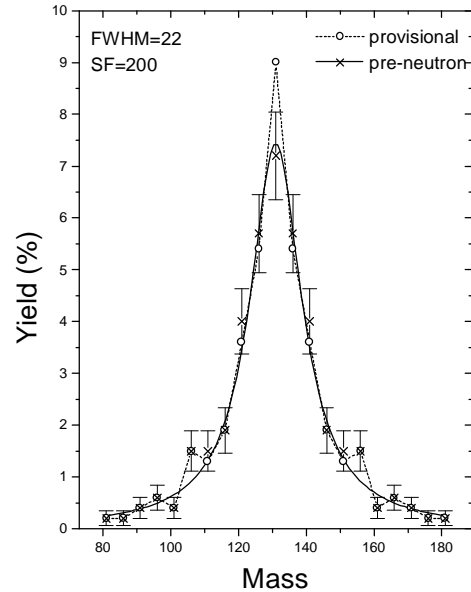


Fig. 2. Lorentzian fit to the pre-neutron-emission mass-yield distribution for ^{262}Rf . Also shown is the provisional mass-yield curve to which no neutron correction was applied. The bars indicate 1σ error limits.